

REMARKS

Claims 6-13 are pending in the present application. By this amendment, the specification has been amended; claims 1-5 have been canceled; and claims 6-13 are newly added. The amendment to the specification is to correct a translation error. As may be seen in the priority document, the temperature range shows from 5 to 120°C, not 5 to 12°C. Newly added claims 6-10 correspond to the subject matter of original claims 1-5 but are rewritten in form more commensurate in scope with US patent practice. Claims 11-13 are directed to embodiments disclosed in the specification at page 8, lines 15-19 and page 9, lines 3-5. It is respectfully submitted that no new matter has been added by these amendments.

Rejections Under 35 U.S.C. §112, second paragraph

Claims 1-5 stand rejected under 35 U.S.C. §112, second paragraph as allegedly being indefinite. This rejection is respectfully traversed.

Applicants have canceled claims 1-5 and added new claims 6-10, the newly added claims being commensurate in scope with the subject matter of original claims 1-5 but written in standard U.S. patent practice. Accordingly, it is respectfully submitted that the rejection of claims 1-5 is now moot and that this rejection be withdrawn.

Rejections Under 35 U.S.C. §102

Claims 1, 2, 4 and 5 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by US 6,290,882 to Maus et al. (hereafter "Maus"). This rejection is respectfully traversed.

Applicants have canceled claims 1, 2, 4 and 5. Nevertheless, the subject matter of these claims is encompassed in new claims 6-10. Claim 6 is directed to a method of forming a molded article comprising the steps of injecting a molding material into a metal mold having at least one pipeline; using a heating medium to heat the metal mold to a temperature 0° to 100°C greater than a heat deformation temperature of the molding material to form the molded article; and using a cooling medium to cool the metal mold to a temperature 0° to 100°C lower than the heat deformation temperature of the molding material during extraction of the molded article from the metal mold; wherein the heating medium and the cooling medium are passed through the same at least one pipeline to either heat the metal mold or cool the metal mold.

The Office Action states that Maus discloses a method for molding an automotive body panel wherein material is injected into a metal mold, the tool temperature Tb was adjusted 0-100° C higher than the heat deformation temperature of the injection thermoplastic resin, and after cooling the tool temperature was adjusted 0-100° C less than the heat deformation temperature of the injection thermoplastic resin while extraction. The Office Action also states that Maus teaches that the mold was maintained at a high pressure while carrying out the mold process and could be used to form a non-painted molded article, such as a fender.

It is respectfully submitted that Maus fails to teach or suggest Applicants' claimed invention. As set forth in claim 6, Applicants' claimed invention provides a method of heating and cooling a mold material to form a molded part. As claimed, the method uses a metal mold having at least one pipeline. A heating medium is passed through the at least one pipeline during the heating step to help accelerate the heating step. Then, during the cooling step, a cooling medium is passed through the same at least one pipeline to help rapidly cool the molded part prior to removal from the metal mold. By using the same pipeline (or series of pipelines) to pump the heating medium and the cooling medium, the respective medium helps flush out remainders of the other medium during the molding process. As a result, the metal mold does not include both a heating medium and a cooling medium in the metal mold at the same time. By having only one medium at a time in the metal mold, the heating and/or cooling steps are not adversely affected by the presence of a heating/cooling medium that is negatively impacting the performance of the molding process, thereby resulting in faster molding cycles and/or improved efficiencies.

Conversely, the methods and articles disclosed by Maus utilize a pair of pipelines and control systems to control the use of heating fluid and cooling fluid in the mold. These pipelines are separate from one another such that both mediums are present during the process (see e.g. col. 9, lines 23-32). Since the heating medium and the cooling medium are present throughout the entire process, these respective mediums will operate to counteract the intended molding step. For example, during the heating step, the cooling medium will slow the heating rate and/or require much higher temperatures of heating medium to achieve a selected heating temperature as the cooling medium will act to cool the mold, even if ever so slightly. Conversely, during the cooling cycle, the presence of the heating medium will act to heat the mold, even if ever so slightly.

By using the same pipeline for the heating medium and the cooling medium, only one medium is present during a given step. The resulting process results in molded articles having improved abrasion resistance, impact resistance, improved surface quality and/or wherein the parts are lightweight and/or inexpensive as compared to prior art molded articles. The molded articles are able to achieve these one or more advantages without an additional coating layer due to the process used to make these articles. As Maus neither teaches this process nor molded articles having one or more of these advantages, it is respectfully submitted that Maus fails to teach or suggest Applicants' claimed invention.

For at least the reasons given above, it is respectfully claim 6 is allowable over the prior art of record. Since claims 7-13 depend from claim 6, it is respectfully submitted that these claims are also allowable.

Rejections Under 35 U.S.C. §103

Claim 3 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Maus in view of US 6,303,070 to Bulters et al. (hereafter "Bulters"). This rejection is respectfully traversed.

Applicants' description of new claim 6 may be relied upon as above.

The Office Action states that Bulters discloses the use of polyethylene terephthalate as a molding material for making automotive parts.

It is respectfully submitted that the combination of Maus and Bulters fails to teach or suggest Applicants' claimed invention. As previously discussed, Maus fails to teach or suggest a molding process using a metal mold having at least one pipeline and wherein the heating medium and the cooling medium use the same pipeline. Bulters fails to remedy the deficiencies of Maus by also failing to teach or suggest a molding process using a metal mold having at least one pipeline and wherein the heating medium and the cooling medium use the same pipeline. Accordingly, the combination of Maus and Bulters fails to teach or suggest Applicants' claimed invention.

For at least the reasons given above, it is respectfully claim 6 is allowable over the prior art of record. Since claims 7-10 depend from claim 6, it is respectfully submitted that these claims are also allowable.

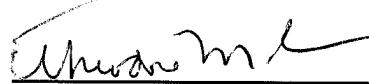
Conclusion

For at least the reasons given above, it is respectfully submitted that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 503622.

Respectfully submitted,

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